



# Chelmsford Amateur Radio Society

Affiliated to the RSGB  
President: Harry Heap G5HF  
Secretary: David Bradley M0BQC

Club Call Sign: G0MWT  
Chairman: John Bowen G8DET  
Treasurer: Brian Thwaites G3CVI

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Newsletter No. 445

February 2003

## The February Meeting. VHF and UHF by Les Barclay G3HTF. Tuesday 4th. February, 7-30pm at the MASC.

Radio waves do some strange things and behave in apparently peculiar ways. Or that's how it would appear at first sight! **Les Barclay G3HTF**, our speaker this month, is one of our Club Members who has made a lifelong study of propagation. We don't often see him at Club Meetings. However, he heads our list of favourite speakers and is always prepared to give us a talk. This time he has chosen to talk about and illustrate the effects of diffraction and refraction on VHF and UHF waves. Sounds rather technical? No problem! We know from past experience that Les has that priceless gift for making abstruse subjects readily understandable!

Newer Members may like to know that Les is a UK delegate to the World Radio Conferences and in the past has told us about the goings on there. As a young man he was concerned with propagation research in Antarctica. He was employed by the Marconi Company, later becoming self employed as a consultant. In between his busy workload he also finds time to support the Dengie Radio Club as President!

We will be holding our usual raffle. This month it will be organised and run by our Secretary David M0BQC assisted by President Harry G5HF or is it the other way round?

### Dates For Your Diary.

February	2	Sth. Essex ARS. 10am, "The Canvey Rally", The Paddocks, Long Road, Canvey.
February	4	CARS Meeting. VHF & UHF Propagation, Les Barclay G3HTF and EGM after.
February	11	2M Club Net starting at 8-30pm on 145.375 MHz.
February	12	CARS Committee Mtg. Danbury Village Hall 7-30pm. Members always welcome.
March	4	CARS Meeting. Visit of PW Editor Rob Mannion G3FXD. 7-30pm. MASC.

### Notice of an Extraordinary General Meeting

There will be an EGM at the end of the February meeting to approve a revised Club Constitution,

### The Canvey Rally

For a number of years the Club has had a stand at the Canvey Rally. In the past this has been a good little earner for Club funds. With your help 2003 will be no exception. If you have any electrical or electronic goods that your wife would like to see the back of, we would be only too glad to dispose of them for her!

If you have any contributions let us know and we will arrange collection or, better still, come along to Canvey and give us your contributions there. We look forward to your support on Sunday 2nd. February.

### Waters & Stanton Open Evening, Monday March 3rd.

A visit to Waters & Stanton has been arranged by Murray G6JYB. Visitors can see the warehouse, the workshop and the Peter Waters Radio Museum. Refreshments will be provided. If you wish to be included, book your place with David M0BQC on 01245-602838. Be advised to book early as numbers are limited.

### Newsletter Distribution.

There has been an unfortunate blip recently. Getting your Newsletter regularly? If not contact me, Geoff G7KLV on 01245-473822. It is available via post or by email. The choice is yours. Want to change, then contact me.

The Chelmsford Amateur Radio Society meets at 7-30 pm on the first Tuesday of the month at the Marconi Athletic and Social Club, Beehive Lane, Chelmsford. For details contact our Secretary David M0BQC on 01245-602838.

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**Deadline for the March Newsletter is Wednesday 12th. February.**

## RSGB Appointment.

Our congratulations to Trevor Hawkins M5AKA, our hard working and dedicated Committee Member and Hon. PRO, has been appointed Deputy Regional Manager for Essex under Malcolm Salmon G3XVV

## Last Months Meeting. The Constructors Evening.

Last month's meeting didn't work out quite as we had planned! Two of our star attractions were unable to be with us. At the last minute Fred G3HNF was involved with family and unable to demonstrate cable terminations and also offer general advice on construction. Carl PEM, who was going to demonstrate soldering, had to cry off at the last minute because of a severe chest infection.

So, let us do the rounds and see what was on offer at the various tables.

Colin G0TRM had set up a working soldering station and displayed a range of multipin connectors showing very clearly the difference between well soldered and badly soldered joints. The opportunity was there for Members to try their hands at soldering if they felt inclined. As well as connectors, Veroboard samples and various components were on hand for inspection. A wide range of wire strippers was on display and Members could practice stripping standard, as well as co-axial cable. As an adjunct to soldering activities he also showed a range of books on the many aspects of antenna theory and practice. These books kept a number of Members engrossed for a large part of the evening and many favourable comments were received. It enabled a prolonged study to be made, aiding the decision on which publication might best suit individual requirements, should the decision to purchase be made. He also demonstrated a number of very small FM broadcast scanning receivers he had received as Christmas and birthday presents.

Murray G6JYB came prepared for a variety of topics including any follow-ups to his previous talk on Freeview TV, his PC-Doctors bag of CD-ROMs, advice for computer issues and copies of Essex Repeater Group material including their recent Xmas Newsletter on the replacements for GB3DA/ER and the first outing of the 2003 ERG Guide.

The Scout's approach of being prepared turned out to be a good plan. Questions ranged from Athlon PC lockups, to TV transmitter strengths, CTCSS and deviation issues on 2m where FM is now on 12.5kHz channels, and problems with the new IARU 6m bandplan.

John, G8DET had a table set up to advance his Kit project. In 1998 he purchased the Remote Imaging Group Receiver, RX2 kit which is tuned to 137Mhz to download weather satellite information for display on a PC. In 1999 he started to construct the kit by enlarging the component lists on a photocopier, attaching the lists on expanded polystyrene board. The idea is to poke the components through the list to keep them in order.

Then in 2000 he checked the resistor values at the last CARS practical evening. This time he was checking the values of the capacitors using a capacitor bridge. The lowest value being 1pF, largest being 100uF and 3 capacitors were rejected as being out of tolerance or incorrectly marked. It is very important to check every component before soldering them into the PCB, as it is very nearly impossible to find them once the unit is completed. With a bit of luck the project might (and we use that term advisedly!) be completed before the satellite falls out of the sky!

Brian G3CVI, had off-loaded his usual duties to Geoff G7KLV and was illustrating his earlier presentation on feeders by applying RF to several types with variable loads and noting the forward and reflected energies and hence the SWRs.

Experiment 1: Set the New Rig to AM and about ten watts output into a 50w coax with an aperiodic dummy load of 50w at the far end. Result was as predicted, zero reflected energy and unity SWR.

Experiment 2: Set same conditions but with two 50w loads in parallel at the far end. Result was some reflected energy with an SWR of about 1.3:1. He explained that this was not very efficient because there was a standing wave on the line causing wastage of energy hence less would be have been radiated had we an aerial at the end.

Experiment 3: Set up similar situation but using a coax of "unknown" characteristics with the single 50w load. Result was an increased reflected energy with an SWR of over 2.5:1...very lossy so obviously not desirable. (he knew the coax was 95 ohms but said nothing till later)

All the above experiments were tried on several bands and the results changed very little except in the third case where the losses got worse as the frequency rose to 14.2 MHz when the reflected power was zero. One Member guessed that was due to a special length of the coax.

Brian admitted "cooking" that situation by calculating the electrical length of a half wave at 14.2 MHz and cutting off a length which was the actual length multiplied by the velocity factor found in the manufacturer's lists...about 0.85. This "trick of the trade" reflects the conditions at the far end back to the transmitter end, which in our case was the desired 50w which matched perfectly. Essentially a 'mono-band' method.

Finally, still describing the system used by the New Rig, he energised the "aerial system tuning unit" and the open wire feeders to the makeshift doublet hung up on the curtains. It all tuned up correctly but little was received due to the low height and the steel framed building.

Strangely most signals were heard on 80 metres the doublet being only about four metres overall.

Harry G5HF started his demonstration by pointing out that in the 1930s power meters, SWR bridges and other ways to monitor aerial performance were not available. RF ammeters were used to measure feeder current. These meters had a hot wire with a thermocouple on it connected to the meter to measure temperature and the instrument was calibrated in Amps. If FSD was exceeded, the wire melted and the meter was wrecked! So for impecunious types car headlight bulbs were used to indicate current. A good guide for measuring this current was to mount two similar bulbs in a light box, one connected to the aerial feed and the other fed with DC through an ammeter and variable resistance. The brilliance is then matched and the current is read off from the DC meter.

This same technology can be used for training purposes to show the current in resonant wire aerials. The demonstration was on 2m, but the principles can be applied to HF aerials. First a quarter wave whip was shown with wheat grain bulbs (from Greenweld) to show the current maximum points (at the feed end) using about 2 watts of power. He showed how the current increases when the aerial is placed on a ground plane.

The same effect can be obtained by fitting a counterpoise and the demonstration showed how the counterpoise carries current and voltage like the aerial and therefore must be insulated. It was shown how an earth leak on the counterpoise reduced the current in the aerial. Voltage was indicated by a "sniffer" (audio or visual), but on high power you can use a neon or a fluorescent tube to indicate voltage.

The next display was a co-linear, two quarter waves in series fed at one end with a small coil. In this case there are two current maxima and the aerial is higher than a quarter wave whip and so is better for mobile use. The final display was a tuned counterpoise, which is ideal for a vertical 20m aerial, as it is compact and suitable for small gardens.

As one might well expect Chris IPU's table was concerned with training. He had a steady stream of M3's interested in the next stage, ie the Intermediate Licence.

The future of Amateur Radio in the past year has been changing to allow a greater access to the amateur radio spectrum for all, from the young to the older and, maybe, the more experienced through the new types of Licences available. With the introduction of the Foundation Licence in January 2002, and after extensive testing of the syllabus in the form of pilot courses run by the RSGB and the Radio-communications Agency, Foundation courses are now available.

The Chelmsford Amateur Radio Society has been very active in running Foundation courses. To date CARS has run five courses, and is now in the first week of the sixth. Registered instructors aided by a dedicated team of tutors run the Courses, which makes for a pleasant environment for all ages to get

a Foundation Licence. Course seven is planned, but needs candidates..... So, if you know any one who is interested....

The next step for those Foundation Licensees, who wish, is to progress to the Intermediate Licence (Note: You now must have a Foundation licence to be eligible for an Intermediate Licence Course). The new Intermediate course syllabus is still undergoing the pilot course stage at present and it is hoped to go live after a second pilot course in March. After this it is hoped that the CARS may be able to offer Intermediate Licence Course's in the autumn in a similar environment.

The new Intermediate Course syllabus builds upon that of the Foundation Licence, briefly revising it and then adding a new and more in-depth section on Receivers & Transmitters, Technical Basics - introducing measurements on a test set based project, and assessment projects of your choice (and the assessor as well!). The course lasts around 20 hours (without assessment projects in course time) or 25 hours if the assessment construction projects are completed in course time.

The exam consists of 40 multi-choice questions over the entire syllabus in one hour, marked on the day. But here lies the glitch! At present, the exam will be held at C&G Satellite Centre's on the last Monday in the month - unlike the Foundation exam. However, this may change and only time will tell.

If you are interested in the new Intermediate course, and wish to get more information, please call Christopher Chapman on 07944 253 852 or e-mail him on [intermediate@chris-chapman.com](mailto:intermediate@chris-chapman.com) and he will get back to you.

Our thanks to all the demonstrators and to Ela G6HKM who looked after the raffle, quite like old times!

## **My First Weeks as an M3 by David Worboys M3CCM.**

I became an M3 in early December 2002 having attended the six week Foundation Course training provided ably by Murray, Chris, Martyn *et al*!

I had my eye on an Icom 706 Mk IIG but was superstitious enough not to purchase one prior to passing the exam and, indeed, I felt a great sense of achievement and not a little relief, when I passed the exam first time! Now to get myself on air. By chance I had been surfing through Amateur radio websites and happened upon HamCity in California.

The day after the M3 exam, I flew to Miami for a 10 day business trip whereupon I called HamCity and they shipped me a brand new rig for \$799 or about £505. This was a huge saving on the sort of prices I would be expected to pay here (£899) in dear old "rip off", sorry, good old reassuringly expensive Britain!

Once back in the UK I set about obtaining a 2m/6m/70cms mobile antenna as well as a 12m one as this is really where my interest lies. Despite the

informative instructions I only needed one call to Icom in the UK to set up the rig for repeater access (really...just the one!) and I soon found myself slipping easily into 2m and 70cm work using my previous experience gained in the mid 1980's. How does the old saying go? You never forget how to ride a bike..? Something like that. Anyway, I was getting good reports and even managed to access GB3DA from the top of Epsom Downs which I think is a pretty good trip!

And so to 12 metres. Due to personal reasons I was initially unable to set up a home base station and so for a while now I have run /m. I was therefore very excited and pleased to QSO with a Southern Ukraine station for my first DX as a licensed amateur. Not bad at all really considering it was freezing cold in the car (the engine interfered with the RX so I couldn't have the heater on), I could only run 10 watts and it was all going through a whip antenna bolted to the back of my car!

So, I am now a few weeks further down the line since gaining my M3 and, apart from spending a disproportionate amount of money on radio gear I haven't actually managed to achieve much else due to the Christmas holidays and so on. I bought the new Icom handheld and used it to great effect through a mag-mounted antenna on a trip down to Cornwall over New Year. I contacted a station in Chippenham, Wilts through the Swindon repeater (GB3WH) when on the M4 and by switching to the Somerset repeater (GB3WR), I lost contact with him just about Exeter on the M5 having spoken for well over an hour and a half and only being thwarted by the batteries expiring!

I would like to thank all of the course instructors for their time and energy in running the six week course and to CARS for making it possible. The M3 licence seems to be a breath of fresh air in the amateur radio spectrum and love it or loathe it, it just has to be good for the hobby in general. Now on to the Intermediate licence!

### Club Contest Callsign M2T from Trevor M5AKA.

The Club now has a new contest callsign M2T. In contests the objective is to work stations as quickly as possible to achieve the maximum number of QSO's in a set time. Having a special 3 character call like M2T takes half as long to say as G0MWT and can result in a significantly higher score.

Due to restrictions currently imposed by the Radio Communications Agency these special callsigns can only be used in International Contests so cannot be used for events such as the RSGB VHF NFD but there are more than enough International Contests around. If you listen to 14 MHz there seems to be a contest of some kind on almost every other weekend. These are the contests M2T can be used in:

IARU 50MHz Trophy (Multi-mode);  
IARU 144MHz Trophy (Multi-mode);

IARU 432MHz - 248GHz (Multi-mode);  
March 144 / 432MHz Contest;  
May 432MHz - 248GHz Contest;  
November Marconi Memorial 144MHz Contest.  
ARRL DX (HF - CW and SSB);  
ARRL 1.8MHz (CW only);  
ARRL 28MHz (Multi-mode);  
CQ WPX (HF - CW, RTTY and SSB);  
CQ World Wide (HF - CW, RTTY and SSB);  
CQ World Wide 160 (CW and SSB);  
IARU Championship (HF - Multi-mode);  
RSGB IOTA (HF - Multi-mode);  
WAE DX (HF - CW, RTTY and SSB);  
ARRL RTTY Roundup;  
BARTG RTTY;

If any Members, especially our new Foundation Members, are interested in taking part in a contest then contact either myself or any other Committee Member.

### Power Regulators by Geoff G7KLV

Being an avid constructor and an inveterate hoarder I am always scavenging for components. Useful sources of components are discarded printed boards from all sorts of sources such as radios, industrial electronics and computers. The wide range of integrated circuits available for the home constructor seems to be drying up, as many are now discontinued or replaced by surface mount devices. I have found many useful and exotic IC's on discarded boards including rare frequency dividers and pulse generating IC's complete with inbuilt crystal oscillators. They are fairly easy to get off the original boards if they are only single sided soldered but much more tricky if they are on double sided board. Coming to the more mundane types, there are plenty of voltage regulator IC's to be found, both positive and negative types. They are mostly dedicated 5 and 12 volt types in the 78XX & 79XX series.

Ok, if you want 5 or 12 volts!  
There are two very simple mods one can do. First, a higher fixed voltage can be produced by the addition of a zener diode so that the regulator sits on top of it. A variable voltage can be produced with the addition of two resistors.

Nothing original, but two very useful dodges!

